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COMMONWEALTH OF PUERTO RICO / OFFICE OF THE GOVERNOR

2/24/03 - 02223

To: Chris Penny

Fax: 757-322-4805

From: Yarissa Martinez

Date: 2/24/03

Re: NFA Report Comments

Pages: 22 + 1

Cc: John Tomik 757-460-4592

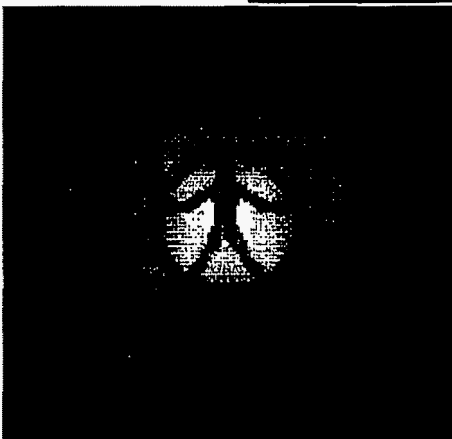
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I sent this through email on Feb 15.

YARISSA MARTINEZ, INC.

EDIFICIO NACIONAL PLAZA / AVE. FONCE DE LEON 431/HATO REY, P.R.



COMMONWEALTH OF PUERTO RICO
OFFICE OF THE GOVERNOR
ENVIRONMENTAL QUALITY BOARD

February 24, 2003

Mr. Christopher T. Penny
Remedial Project Manager
Naval Facilities Engineering Command
Atlantic Division, Code EV 23
1510 Gilbert Street
Norfolk, VA 23511-2699

Comments on the No Further Action Report

Dear Mr. Penny:

The Puerto Rico Environmental Quality Board (EQB) respectfully submits to U.S. Department of the Navy the comments contained herein regarding the environmental investigation of some of the sites with potential contamination on Vieques Island. The reviewed documents dated November 2002, are the "Draft for No Further Action Report for Nine Sites, Former U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico" Volumes 1 & 2.

According to previous conversations, EQB will be waiting for the "Revised Draft for No Further Action Report for Nine Sites, Former U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico," in order to conduct the Public Hearings on the document. Therefore, as soon as you have an estimated date for its release, please let us know.

If you have any questions or comments, do not hesitate to contact Yariisa Martinez at 787-365-8573.

Cordially,

A handwritten signature in dark ink, appearing to read "Esteban Mujica", is written over a horizontal line.

Esteban Mujica Cotto
President

Enclosure



Comments on EVALUATION OF "DRAFT NO FURTHER ACTION REPORT FOR NINE SITES, FORMER U.S. NAVAL AMMUNITION SUPPORT DETACHMENT
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**EVALUATION OF "DRAFT NO FURTHER ACTION REPORT FOR NINE SITES,
FORMER U.S. NAVAL AMMUNITION SUPPORT DETACHMENT, VIEQUES ISLAND,
PUERTO RICO, VOLUMES 1 AND 2, DATED NOVEMBER 2002.**

I. Overview

The Navy has submitted for review a No Further Action report for nine (9) sites previously considered within Preliminary Assessments/Site Investigations (PA/SI) at the Former U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico. EQB reviewed the above-referenced document to evaluate the appropriateness of the risk assessment and NFA recommendations. EQB considered the following documents during this review:

- Risk Assessment Guidance for Superfund (RAGS), Parts A – EPA/540/1-89-002, Part B – PB92-963333, Part C – PB92-963334, Part D – Publication 9285.7-01D, and Part E – EPA/54-/R/99/005.
- Draft Expanded Preliminary Assessment/Site Investigation, Phase II Seven Sites, CH2MHill, Tampa, Florida, July 2001
- Final Expanded Preliminary Assessment/Site Investigation, Phase II Seven Sites, CH2MHill, Tampa, Florida, November 2002
- Phase I Expanded Preliminary Assessment/Site Investigation, U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico, October 2000

EQB comments are organized below into the following sections: Section 1 – Major Comments, Section 2 – General Comments, Section 3 – Comments Previously Provided to the Navy, and Section 4 – Page-Specific Comments.

A. Major Comments

1. The finding of NFA is premature since site characterization has not been adequately conducted and the risk assessment can only be performed after the nature and extent have been completely delineated as detailed in Section 3 for all SWMUs/AOCs.
2. The Navy must provide a reference and a summary of historical munitions



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assessments (including interviews), independent third-party confirmation of aerial photographic analyses, general magnetometer surveys of the Naval Ammunition Support Detachment (NASD), and site-specific surveys for munitions and unexploded ordnance (UXO). The report must discuss situations in which study results indicated the absence of munitions that were subsequently found to be erroneous (false-negative) and the corrective actions performed. The Navy must provide a clear association of all potential source areas with historical data, site operations and the rationale for selection of sampling locations. This must be provided prior to finalizing site characterization and risk assessments.

3. Prior to finalizing a risk assessment, the Navy must demonstrate that no munitions or related items (pyrotechnics, propellants, smokes, etc.) were stored, handled, used, managed, or disposed of at the subject AOCs/SWMUs. At any site where the potential for munitions use exists, results of analyses for explosives, perchlorate, firing by-products, and breakdown product compounds must be provided for all environmental samples. Analytical results must be provided with detection limits below health-based criteria (MCLs, Region 9 PRGs). Any assessment of perchlorate must consider that ongoing risk evaluations at other military installations are likely to adopt a 1.5 ug/L standard.
4. The NFA recommendations do not include an ecological assessment. The NFA report should describe in detail the data, results, and findings from the ecological risk assessment.
5. Analytical data from ground water samples must be obtained to demonstrate an absence of hazardous and munitions-related constituents at the following AOCs/SWMUs: SWMU-5, SWMU-10, AOC B, and AOC L. The Navy has not conducted ground water sampling based on the assertion that the absence of contamination in surface and subsurface soil supports an anticipated absence of contamination in ground water. However, migration via soil leaching may have depleted contaminants from the soil possibly to levels below screening criteria and resulted in contamination of ground water. The Navy must conduct a quantitative risk assessment for ground water.

B. General Comments:

1. The U.S. Environmental Protection Agency's Risk Assessment Guidance for Superfund (RAGS) Part D Format should be used for presenting data tables in the risk assessment. The current tables do not present the data in a manner that facilitates independent review. This common industry standard improves transparency, clarity, and consistency.
2. The procedures used to screen sub-surface soils may not be protective of



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human health because the risk assessment does not address exposure from direct contact to sub-surface soil (e.g. utility/construction worker). The Region 9 Preliminary Remediation Goals (PRGs) do not address short-term exposures. However, the PRG guidance document states that for pathways not covered by PRGs, a risk assessment specific to these additional pathways may be required. Note: Region 9 PRGs can be used as a conservative measure to screen for chemicals of potential concern (COPCs) for the subsurface soil.

In addition, risk associated with the potential exposure to groundwater for the utility/construction worker should be evaluated.

Finally, the Conceptual Site Models for each solid waste management unit and area of concern (SWMU/AOC) should include the utility/construction worker for exposure to surface soil, subsurface soil, and groundwater.

3. Details pertaining to media-specific sampling procedures, including sampling depths should be provided in the report. This information is necessary in order to determine if appropriate sampling procedures were used during data collection and to determine if depths and locations are appropriate relative to potential receptors.
4. The complete data set, including quantitation limits must be provided in the report. This information is essential for conducting a thorough review of the data and is needed to verify that COPCs were calculated correctly.
5. A summary of quality assurance and quality control (QA/QC) of the data needs to be provided in the report. This information is essential in determining if the data are usable for risk assessment.
6. Units need to be provided for all factors shown in tables provided in the appendices of this report. This is especially important for the risk calculation spreadsheets. Please provide units for all data and other factors used in the risk calculations.
7. Details pertaining to the evaluation of background samples should be summarized in the report. The determination of background should be based on the U.S. Environmental Protection Agency (EPA) Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLIS Sites, (September 2002). Documentation needs to be provided that demonstrates that a reliable representation of background has been established and to show that the appropriate statistical methods were used to characterize background



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concentrations of chemicals in soil.

8. Given the close proximity of the SWMUs/AOCs, it would be more appropriate to evaluate risks associated with exposure to groundwater by combining the data across each Site.
9. The figures providing sampling location and sampling results do not provide sufficient detail regarding reference points and landmarks. The figures do not facilitate independent determination of the appropriateness of sampling locations. The figures should also identify the boundaries of the SWMU/AOC, where the release occurred, and where the samples were collected in relation to the release.

D. Comments Previously Provided to the Navy

PA/SIs for eight of the nine sites in this NFA report had been previously reviewed and comments provide to the Navy. The sites previously reviewed include: AOC B, AOC C, AOC F, AOC K, AOC L, SWMU-10, SWMU-14, and SWMU-15. These reports were presented in the following reports:

- Phase I Expanded Preliminary Assessment/Site Investigation, U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico, October 2000
- Draft Expanded Preliminary Assessment/Site Investigation, Phase II Seven Sites, CH2MHill, Tampa, Florida, July 2001
- Final Expanded Preliminary Assessment/Site Investigation, Phase II Seven Sites, CH2MHill, Tampa, Florida, November 2002

The PA/SI for the ninth SWMU, SWMU-5, had not been considered in these previous document reviews. Comments to SWMU-5 are presented herein for the first time.

Comments to the eight AOC/SWMUs were provided to the Navy on April 15, 2002. Prior to the November 2002 NFA report, responses from the Navy were not provided to EQB. Appendix A of the current NFA report provides responses to three of the AOCs/SWMUs: AOC B, AOC K, and AOC L. Text in the current NFA report discusses a limited number of issues identified in the EQB PA/SI evaluations.

Listed below are comments from the previous evaluations, which have not been adequately addressed.



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Major Comments

1. The NFA recommendations made by the Navy at the eight locations can not be fully evaluated without detailed information regarding past activities at these sites. The Navy has used Vieques Island since the early 1940s, yet the site descriptions provided in the PA/SIs summarize current conditions with only a brief reference to former use. The PA/SIs did not present or reference any studies of archives, records, reference sources or interviews conducted to document past site activities. This information is essential to evaluate whether the site surveying and testing performed by the Navy is adequate, especially with regard to munitions handling and storage. Since munitions were stored and disposed on the western portion of the island, it is vital to provide additional discussion of past site use.
2. Additional geophysical survey data is necessary at each site prior to concluding that NFA is appropriate. Because of the long history of military use of Vieques Island, it is likely that unknown trenched waste disposal areas as well as surface and subsurface munitions storage and disposal areas are present that might not be identified by an archive search.
3. The NFA recommendations planned by the Navy are not acceptable without additional information/investigation at AOC B, AOC C, AOC F, AOC K, AOC L, SWMU 10, SWMU 14, and SWMU 15. The additional information/investigation necessary is identified in comments regarding each AOC or SWMU in the next section of this report.
4. Munitions utilization records for the Island need to be evaluated to identify the chemical composition of munitions historically stored at the Naval Ammunition Support Detachment. The chemical composition data must then be evaluated to determine appropriate chemical analytes for investigation of possible munition disposal sites.
5. ...The PREs need to consider ecological benchmarks in addition to human health.
8. The Navy should provide results of closure surveys of all drainage structures at SWMU 14, AOC C, AOC F and AOC B in which the integrity of the structures is surveyed for cracks or breaks. Based on the findings of this survey, additional soil and ground water samples may be required at areas of questionable integrity to verify that there have been no impacts to the environment.



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**Comments on Final Expanded Preliminary Assessment/Site Investigation,
Volume I - Report, October 2000**

SWMU 10 - Waste Paint and Solvents Disposal Site

General Comment

- The Navy did not obtain any ground water samples at this site. Due to the nature of possible waste disposal at this site, ground water sampling is mandatory.

SWMU 14 - Wash Rack

Page Specific Comments

Page 8-1, ¶4: An investigation of the swale that received runoff water from the driveway needs to be conducted.

SWMU 15 - Waste Transportation Vehicle

General Comments

- The location of the truck must be presented to evaluate the appropriateness of the soil and ground water sample locations.

AOC C- Drainage Ditch in the Vicinity of Transportation Shop Area

Page Specific Comments

Page 10-3, ¶1: The Navy indicates that they installed one monitoring well down-gradient of the septic tank. However, with only one monitoring well, it is not possible to know which way ground water flows, and whether the well is indeed down-gradient. Furthermore, it is not known where the leach field is, and whether the well was placed down-gradient of this potential release area. Additional information is needed to verify that this well is down-gradient of the source/release area prior to recommending NFA for this site.

Page 10-5, ¶1: The Navy did not screen the sediment results against any soil or sediment criteria because these samples "are not considered media samples." While it is not clear what this statement means, the Navy needs to present these data (they are not included in the report) and properly screen these samples prior to making an NFA



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recommendation.

AOC E - IIC Septic System

Page Specific Comments

Page 12-2, ¶6: It is not clear whether there is a leaching field associated with this septic tank and whether the wells were placed to examine releases from an associated leaching field. If a leaching field is present, the Navy needs to indicate whether the sampling points are adequate, or if additional sampling points are needed.

Figure 12-1: Soil sampling needs to be performed to evaluate whether there were releases from the concrete pad.

COMMENTS ON DRAFT EXPANDED PRELIMINARY ASSESSMENT/SITE INVESTIGATION, PHASE II, SEVEN SITES, CH2MHILL, TAMPA, FLORIDA, JULY 2001

AOC B - Wastewater Treatment Plant

Page Specific Comments

Page 3-6: No ground water data are available to assess ground water quality impacts. Samples need to be collected from a minimum of two water table ground water monitoring wells and analyzed for the full suite of parameters.

AOC I - Septic Vault

General Comment

- Samples from a minimum of two ground water monitoring wells need to be collected and analyzed for the full suite of analytes. These results are necessary to evaluate the ground water quality impacts from the site.

Page Specific Comment

Page 8-2, ¶5: It is not clear whether the subsurface soil samples at this site were obtained below the discharge depth of the vault. Data should be provided to indicate the depth of the subsurface samples. If they were not collected below the discharge depth of the vault, deeper samples should be obtained prior to recommending NFA for this site.



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D. Page Specific Comments:

4.1 SWMU 5

Page 2-1, Section 2.1.3 The Navy must collect a minimum of one (1) sample from a downgradient water table monitoring well and analyze for the full suite of parameters. The admitted disposal of approximately 7,000 pounds of fuel, red fuming acid, and amine fuel (Page 2-1, Section 2.1, Paragraph 2) may have resulted in impacts to soil and ground water. Under this conceptual model, transport may have included longer-term migration via soil leaching depleting contaminants from the soil possibly to levels below screening criteria. This model is a reasonable and plausible hypothesis and contradicts the Navy's assertion (page 2-7, Section 2.2.1.1 Paragraph 3) that the absence of contamination in surface and subsurface soil supports an anticipated absence of contamination in ground water.

Page 2-3 ¶ Table 2-1 Please provide additional documentation showing the calculation of the benzo(a)pyrene equivalents (BEQ). The results provided in Table 2-1 could not be verified. An alternative approach for calculating risk associated with carcinogenic Polycyclic Aromatic Hydrocarbons (PAHs) is to retain each individual carcinogenic PAH as a COPC and adjust the slope factor available for benzo(a)pyrene by the relative potency factors provided in Table 8 from the EPA Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons. This approach is beneficial in that it allows for evaluation of each PAH and its contribution to the combined Site risks.

Page 2-2 ¶ 5, Figure 2-5 and page E-1-4: Refer to General Comment # 2 above pertaining to the evaluation of the Utility/Excavation Worker.

Page 2-8 ¶ 5: This paragraph is supposed to discuss the Conceptual Site Model. It appears to be a brief discussion of the fate and transport of potential Site contaminants. Please provide a discussion of the information provided in Figure 2-6 as was done for other SWMUs/AOCs.

4.2 SWMU 10

Page 3-1 ¶ 1: Identify the source of the information that indicates that the total volume of materials disposed onto the ground at SWMU-10 was less than one (1) gallon.

Pages 3-1 through 3-6, Section 3.2.1: The Navy must collect a minimum of one (1) sample from a downgradient water table monitoring well and analyze for the full suite of parameters. The admitted disposal of small quantities of paints, solvents, and thinners on the ground outside Building 4001 (Page 3-1, Section 3.1, Paragraph 1) may have



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resulted in the transport of contaminants from soil to ground water. Under this conceptual model, transport may have included longer-term migration via soil leaching depleting contaminants from the soil possibly to levels below screening criteria. This model is a reasonable and plausible hypothesis and contradicts the Navy's assertion (page 3-1, Section 3.2.1, Paragraph 2) that the absence of contamination in surface and subsurface soil supports an anticipated absence of contamination in ground water.

Page 3-4 ¶ 3, Figure 3-5 and page E-3-2: Refer to General Comment # 2 above pertaining to the evaluation of the screening criteria for subsurface soils.

Page 3-7 ¶ 3: The argument provided in the paragraph for not evaluating groundwater is not acceptable, given that the Site was in use from as far back as 1930. Solvents and waste may have impacted groundwater. Contamination in soil may have leached to concentrations below screening criteria.

Page 3-7 ¶ 6: The statement pertaining to the estimated combined Excess Lifetime Cancer Risk (ELCR) for the industrial worker incorrectly includes exposure to groundwater. Exposure to groundwater is not presently evaluated for the Site, but must be added.

Figure 3-5: See General Comment # 2 above pertaining to the evaluation of the Utility/Excavation Worker.

4.3 SWMU 14

Page 4-1 through 4-12: The discussion of SWMU-14 must be expanded to include sediment samples SD-1, SD-2, SD-3. Results for these samples are presented in Appendix B and exceed ecological risk criteria for copper, mercury, 2-methylnaphthalene, bis(2-ethylhexyl)phthalate, naphthalene, nickel, p,p'-DDE, p,p'-DDT, phenanthrene, pyrene, and zinc. The location and sampling technique must be detailed so that it can be determined if the appropriate sampling locations were sampled and to evaluate if appropriate sampling techniques were used. The results must be evaluated using appropriate human health criteria.

Page 4-6 ¶ 1 and page E-4-2: Refer to General Comment # 2 above pertaining to evaluation of risk associated with subsurface soil.

Page 4-6 Table 4-2: Mercury should have been selected as a COPC as demonstrated in Appendix B-1 page 15 of 72 for exceeding SSLs.

Page 4-6 ¶ 2: Describe the sampling procedures used for sampling unfiltered groundwater samples. Specifically, were samples collected using low-flow sampling



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techniques)

Page 4-6, ¶ 2: The turbidity of the groundwater samples and method of collection (i.e., low-flow) should be presented. Without this information, it is unclear if the metal compounds are associated with suspended particles, improper well construction, and/or sampling error or naturally occurring condition (e.g., colloidal materials with dissolved concentrations).

Page 4-6, ¶ 1 and Page 4-7, Section 4.2.2: Field notes, observations, measurements, and sample results obtained during the oil water separator (OWS) removal should be incorporated into the subsurface soil discussion and fate and transport assessment to provide a comprehensive discussion of all site-related data.

Page 4-7, ¶ 3: Resampling of SWMU-14 MW-01 should be performed to verify the cause of the dieldrin detection (e.g., sampling or analytical artifact). If dieldrin is detected in the second sample, then additional investigation must be conducted to identify the source and extent of contamination. The concentration of dieldrin detected in SWMU MW-01 (0.01 ug/L) exceeds the tap water PRG (0.0042 ug/L).

Figure 4-5, Figure 4-5 and page E-4-2: See General Comment # 2 above pertaining to the evaluation of the Utility/Excavation Worker.

Page 4-11 ¶ 1: The text incorrectly refers to Table 4-5 as presenting the risk characterization summary for the quantitatively evaluated receptors for SWMU 14. Table 4-5 presents the Exposure Point Concentrations for Surface Soils at SWMU 14. The referenced table is missing from the report. Please provide the appropriate table.

4.4 SWMU 15

Page 5-1 ¶1: Please provide the time frame when the release at SWMU 15 may have occurred. This information is useful in determining the potential fate and transport of potential contamination at SWMU 15.

Page 5-1 ¶ 2: Explain why subsurface soil samples were not collected. Section 5.2.1.1 indicates that several inorganic chemicals and two PAHs were detected at concentrations exceeding either the residential PRG and /or leachability screening criteria (SSLs). These exceedances trigger the criteria that were used to determine whether the collection of subsurface soil samples is warranted

Page 5-3 ¶ 1: The location of the former storage truck should be indicated in Figures 5-3 and 5-4 to facilitate an independent assessment of the appropriateness of the soil and ground water sample locations.



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Page 5-3 ¶ 3: This paragraph indicates that there were two PAHs detected at concentrations above the screening criteria. Table 5-1 only shows Benzo(a)pyrene as a selected COPC. Please clarify the apparent contradiction between the text and table.

Figure 5-5, Figure 5-5 and page E-5-2 ¶1: See General Comment # 2 above pertaining to the evaluation of the Utility/Excavation Worker.

Page 5-9 ¶ 5: The text incorrectly refers to Table 5-4 as presenting the risk characterization summary for the quantitatively evaluated receptors for SWMU 15. Table 5-4 presents the Exposure Point Concentrations for Surface Soils at SWMU 15. The referenced table is missing from the report. Please provide the referenced table.

Page 5-10 ¶ 4: This paragraph states that the cancer and health hazard effects for SWMU 15 are within acceptable limits for maintenance workers, industrial workers, recreational receptors, and residential receptors. The residential receptors should not be included in this statement, as the hazard index (HI) for the child and adult receptors exceeds the acceptable non-cancer risk limit of 1.0.

Page 5-11 ¶ 4: This paragraph correctly identifies the child residential HI as exceeding the acceptable non-cancer risk criteria of 1.0. However, the HI (1.68) for the adult residential should also be identified as exceeding the acceptable non-cancer risk criteria and that the risk driver is Iron in surface soil.

4.5 AOC B

Pages 6-1 through 6-5: Samples need to be collected from a minimum of two (2) water table ground water monitoring wells and analyzed for the full suite of parameters. The admitted disposal of hazardous constituents at the waste water treatment plant (WWTP) (Response to EQB Comment 1, page J-1, Appendix J of the Final Expanded Preliminary Assessment/Site Investigation, dated November 18, 2002) using unlined lagoons would have resulted in the release and subsequent transport of contaminants from soil to ground water. This transport would have included longer-term migration via soil leaching depleting contaminants from the soil possibly to levels below screening criteria. This would invalidate the Navy's Response to EQB Comment 3 (page J-2, Appendix J) that correlates an absence of contaminations above screening criteria in surface soil and subsurface soil with an anticipated absence of contamination in ground water.

Table 6-1: There appears to be an error in this table pertaining to the Best Estimate of the Mean (0.84) and the Maximum Detected (0.68) concentration of Thallium. The maximum concentration should be greater than the mean concentration.



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Page 6-5 ¶ 1: See General Comment # 2 above pertaining to the evaluation of the Utility/Excavation Worker.

Page 6-5 ¶ 2: See General Comment # 2 above pertaining to the screening criteria used to evaluate subsurface soil. In addition, the sentence "All chemicals analyzed in the subsurface soil were either not detected or were detected below the screening criteria for leachability (SSLs), and other compounds." is confusing. Please clarify what "other compounds" means in this sentence.

Page 6-6 ¶ 7, Figure 6-5, and page E-6-2: See General Comment # 2 above pertaining to the including the Utility/Construction Worker in the Conceptual Site Model.

Page 6-8 ¶ 5: This paragraph incorrectly refers to Table 6-3 as a summary of the risk characterization for the quantitatively evaluated receptors. Table 6-3 presents the Exposure Factors for Receptors Exposed to Surface Soils at AOC B. The referenced table is missing from the report. Please provide the referenced table.

4.6 AOC C

Page 7-1 ¶ 1: Please provide a time frame for when the disposal activity occurred at this site. This information is useful in determining the potential nature and extent and fate and transport of contamination at the site and the applicability of the conceptual site model.

Page 7-1 ¶ 4: Please provide an explanation why subsurface soil samples were not collected in the two ditches along with surface soil samples.

Page 7-3 ¶ 1: The rationale for COPC section needs to be clarified in this paragraph. This paragraph suggests that all soil samples (surface and subsurface) were screened against Region 9 PRGs. Table 7-2, AOC C COPC Selection for Subsurface Soil suggests that subsurface soils were only screened against SSLs. In addition, groundwater samples were also screened against MCLs.

Page 7-3 ¶ 2: This paragraph suggests that volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, and polychlorinated biphenyls (PCBs) may have been detected in site surface soil samples at concentrations below the screening criteria. Compounds detected below screening criteria are relevant to the nature and extent of contamination determination. Therefore this information should be presented in the report.

Page 7-8 ¶ 7, Figure 7-5, and page E-7-2: See General Comment # 2 above



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pertaining to the evaluation of the Utility/Excavation Worker.

4.7 AOC F

Page 8-1, Section 8.1, Paragraph 1 The text should indicate the presence or absence of a leaching field associated with the septic tank. If a leaching field is present, then the boundaries must be indicated in Figures 8-3 and 8-4 and the appropriateness of the sample locations evaluated. Additional ground water or soil samples must be recommended if the current sample locations do not appropriately address/identify potential impacts downgradient from the leachfield.

Figure 8-3: Please include the location of the former Underground Septic Tank on this figure for reference.

Figure 8-4: Please include the location of the former Underground Septic Tank on Figure for reference. In addition, paragraphs 1 and 2 on page 8-4 indicate that chromium and thallium are the only two inorganics that were detected in Site subsurface soil samples at concentrations above screening criteria. This figure suggests that aluminum, cobalt, copper, iron and manganese were also selected as COPCs. Please clarify this discrepancy between the text and Figure 8-4.

Page 8-4 ¶s 1 and 2: These two paragraphs indicate that chromium and thallium are the only two inorganics that were detected in Site subsurface soil samples at concentrations above screening criteria. However, Table 8-1 shows that aluminum, cobalt, copper, iron and manganese were also selected as COPCs. Please clarify this discrepancy between the text and Table 8-1.

Page 8-6 ¶ 3: The first sentence of this paragraph must be deleted. The sentence is based on the flawed logic that since chromium was not detected in groundwater at concentrations that exceeded applicable screening criteria, that the chromium detected in subsurface soil at concentrations that exceed the SSL leachability criteria are not leaching to groundwater. This ignores the possibility of future increases in contaminant levels in groundwater with continued soil leaching.

Page 8-7 ¶ 4 and Figure 8-5 and page E-8-1: See General Comment # 2 above pertaining to the evaluation of the Utility/Excavation Worker. In addition, Figure 8-5 incorrectly lists particulate inhalation as a potential exposure route. The correct potential exposure route is volatile inhalation from groundwater.

4.8 AOC K

Page 9-1 ¶ 4: Information pertaining to laboratory and field quality control samples



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(i.e., laboratory and field blank samples results) should be presented in an assessment prior to the determination that bis(2-ethyl)phthalate is considered to be a laboratory or sampling contaminant. Phthalates are also used in munitions and should not be dismissed prematurely.

Page 9-6, Figure 9-5, and page E-9-1: See General Comment # 2 above pertaining to the evaluation of the Utility/Excavation Worker. In addition, Figure 9-5 incorrectly lists particulate inhalation as a potential exposure route. The correct potential exposure route is volatile inhalation from groundwater. In addition, this exposure route should not be selected as a complete pathway because VOCs were not detected in groundwater. Finally, the figure incorrectly shows that the maintenance worker, recreational adult and recreational child scenarios are complete pathways.

4.9 AOC L

Pages 10-1 through 10-5, Section 10.2.1: Samples need to be collected from a minimum of two (2) water table ground water monitoring wells and analyzed for the full suite of parameters, including explosives and perchlorate. There is no information to confirm that the tank did not leak or that contamination did not seep through the concrete walls or floor of the tank. The Response to EQB Comment 5 (page A-2, Appendix A) does not provide any data to confirm that the tank did not leak (or seep). The Response suggests that surface and subsurface soil samples collected around the tank indicate the absence of release to ground water. This suggestion does not consider that given the potential for associated releases, contamination may have leached from soil to concentrations below screening criteria, while impacting ground water. Note that the depth of the samples is not provided as requested in EQB Comment 6. The response to EQB Comment 6 (page A-3, Appendix A) does not provide the depth but indicates that the samples were collected below "discharge depth." Additional documentation is required to allow independent assessment of the adequacy of characterization.

Page 10-6 ¶ 3, Figure 10-5, and page E-10-1: See General Comment # 2 above pertaining to the evaluation of the Utility/Excavation Worker.

Page 10-6 ¶ 3: Risks associated with exposure to groundwater must be evaluated for this AOC.

Page 10-6 ¶ 5: The text incorrectly refers to Table 10-2 as presenting the exposure pathways for the evaluated scenarios for AOC L. Table 10-2 presents the AOC L COPC Selection for Subsurface Soil. The correct table to reference is Table 10-3.

Page 10-6 ¶ 5: The text incorrectly refers to Table 10-3 as presenting the risk



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characterization summary for the quantitatively evaluated receptors for SWMU 14. Table 10-3 presents the Exposure Point Concentrations for Surface Soils at SWMU 14. The referenced table is missing from the report. Please provide the referenced table.

4.10 Summary and Recommendations by Site

Page 11-1 Table 11-1: The status for the Unacceptable Human Health Risk column incorrectly reports a "No" status for SWMU 10, SWMU 14, SWMU 15, AOC B, AOC C, AOC F, and AOC K. Unacceptable risk were calculated for each of these SWMUs as was summarized in the individual write-ups and on the risk summary table provided in Table 11-2.

Page 11-3 ¶ 1: This paragraph reports benzo(a)pyrene as a COPC for SWMU 5. It should state that BEQ is a COPC to be consistent with Table 2-1 in Section 2.2.2.

Page 11-4 ¶1: This paragraph incorrectly identifies a slightly elevated health hazard associated with ingestion of groundwater by an industrial worker. The HI for this scenario was 0.13, which is below the acceptable risk criteria of 1.0.

Page 11-4 ¶ 3: This paragraph incorrectly states that the cancer and health hazard effects are within acceptable limits for the residential adult receptor. The HI for this scenario is 1.7, which is above the acceptable risk criterion of 1.0.



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4.11 Appendix B

The data provided in Appendix B includes detected results only. A complete data set should be provided in order to evaluate the accuracy of the statistical data analysis for this risk assessment. In addition, detection limits should be provided in order to determine if appropriate detection limits were achieved (i.e., if detection limits exceed screening criteria, contaminants may be present at concentrations that could result in an unacceptable risk). The detection limits are also required to generate the Exposure Point Concentrations (EPCs) for the selected COPS. Thus, the calculated exposure point concentrations could not be verified.

4.12 Appendix C

Units should be provided for the sample results and for the screening criteria.

Page 61 through 64: The data provided on these pages appears to be from sediment samples. The text does not discuss the collection of sediment samples. If sediment samples were collected, the potential risks associated with exposure to Site sediments should be evaluated. In addition, it appears that the sediment data was screened against ecological screening criteria. Although this type of screening may be appropriate for an ecological risk assessment, it is not an acceptable procedure for human health risk assessments.

Page 72: The data provided on this page appear to be samples (SD and SL) that were collected from AOC B. It is unclear what these samples are. Please clarify the type and locations of these samples, and, if necessary, include information pertaining to these samples in the risk assessment.

4.13 APPENDIX D

1. Please provide units on all factors provided in the spreadsheets in Appendix D.
2. Please provide references for all chemical specific absorption factors on the spreadsheets provided in Appendix D.
3. For many of the spreadsheets provided in Appendix D, there are values provided in the column next to GI Absorption Factor (ABS_{GI}) that are not identified. Please identify these values.
4. When evaluating dermal exposure to groundwater, the use of 10 minutes as the exposure duration for a bathing event under a reasonable maximum exposure



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(RME) exposure scenario is not consistent with EPA's dermal guidance, which recommends a value of 35 minutes for an adult and 1 hour for a child. These recommended values are based on data from the Exposure Factors Handbook (EPA 1997) and are more representative of a RME scenario and should be used in evaluating dermal exposure.

Appendix D-1 and D-2: The values provide in Table Appendix D-1, Soil Screening Criteria for Detected Chemicals should be reviewed. Several of the values provided in this table are slightly different from the values provided in the most recent online Region 9 PRG tables and EPA's March 2001 Supplemental Guidance for Developing Soil Screening Values. Note that the values provided for Aldrin are significantly different than those provided in the noted references.

Appendix D-3: This table should include the Utility/Excavation scenario as a potential receptor. If there is adequate justification for not evaluating this scenario, the rationale should be provided in the text portion of the report and this scenario should be discussed qualitatively in the risk assessment.

Appendix D-4: Information pertaining to the Exposure Time for each of the evaluated scenarios is missing from this table.

Appendix D-6: Several COPCs are missing from this table. Please update this table to include the required information for all COPCs. Also, please provide the references for the provided Dermal Absorption Factors and Permeability Constants so that these values can be verified.

Appendix D-11, D-28, D-45, D-70, D-95, D-112, D-153, D-170: Please provide additional detail on the development of the equations used to calculate an age-adjusted chronic daily intake (CDI). The CDI equation for the dermal pathway is not consistent with the approach for developing an age-adjusted dermal factor as outlined in RAGS Part E. The age-adjusted dermal factor includes child and adult body weights (BW_s) and adherence factors (AF_s). These factors do not appear to be included in the age-adjusted skin surface area factor developed for this risk assessment. Age-adjusted dermal factors should be developed rather than age-adjusted skin surface area factors to ensure that large differences in body weight and activity-related adherence factors are taking into account in the risk assessment. For example, the Soil-Skin Adherence Factor for a Groundskeeper is inappropriate for a child. An activity-specific Soil-Skin Adherence Factor for a child should be incorporated into the age-adjusted dermal factor. All exposure parameter values and subordinate equations should be provided.

In addition, please provide the exposure parameters and equation used in calculating a SA_{adj} of 2671 [(mg²-yr)/(kg-day)]. The reference indicates it is based on adult body



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part skin surface areas, yet it is supposed to represent both child and adult skin surface areas. In addition, when the values and units presented for the age-adjusted dermal pathway are input to the CDI adj equation, the resulting units are mg/kg^2 .

In addition, please provide additional detail on the development of the equation used to calculate the age-adjusted CDI for the inhalation pathway. The Age-adjusted Inhalation Rate appears to include body weight, yet body weight is also included in the CDI equation. In addition, the CDI equation does not appear to include the Averaging Time (AT). When the values and units presented for the age-adjusted inhalation pathway are input to the CDI adj equation, the resulting units are mg/kg-m^3 .

Finally, please provide the exposure parameters and equation used in calculating an age-adjusted Inhalation Rate of 13 mg-yr/kg-day .

Appendix D-62a through D-69: These risk summary tables indicate that the risk associated with exposure to groundwater at SWMU 14 was calculated twice. The first set of calculations (Tables D-62B through Appendix D-64b) appear to present the correct calculated risk to the selected groundwater COPCs. Tables D-66 through D-69 appear to include additional COPCs that were not selected as Groundwater COPCs for SWMU 14. Please clarify the purpose of the addition risk evaluations or eliminate the unnecessary risk spread sheets. Note that some renumbering of risk spreadsheets will be necessary if risk spreadsheets are eliminated in Appendix D.

Appendix D-62b, D-66, D-141, and D-149: Footnote (a) on each of these spreadsheets indicates that the calculation for dermal risk due to direct contact with groundwater does not include exposure during showering. This is inconsistent with EPA's dermal guidance, which recommends a value of 1 hour dermal exposure during showering/bathing for a child. The equation and assumptions provided on Appendix D-62a suggest that the dermal pathway for the child resident includes exposure to the total body surface area, which is consistent with the showering pathway. Thus, it appears as though the footnote may be incorrect.

Appendix D-64a, D-137, and D-145: The equation provided for CDI_{adj} must be corrected since it includes a conversion factor that is not necessary.



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In addition, please note that the age-adjusted body weight used in developing a CDI for carcinogenic compounds is based on both a 15-kg child and 70-kg adult rather than just a 70-kg adult.

Also, the approach used in developing a CDI for constituents in groundwater via dermal exposure is not consistent with current EPA guidance. Please refer to EPA's Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual Part E, Supplemental Guidance for Dermal Risk Assessment, Interim, dated September 2001 for guidance on evaluating this route of exposure. This guidance also provides dermal permeability constants (Kps), both experimental and calculated, for a multitude of chemicals. Selecting the appropriate value or calculating a value using the algorithms presented in the guidance is preferred to using a default value of 0.001. As stated above, the use of 10 minutes as the exposure duration for a bathing event under a RME exposure scenario is not consistent with EPA's dermal guidance, which recommends a value of 35 minutes for an adult and 1 hour for a child. These recommended values are based on data from the Exposure Factors Handbook and are more representative of a RME scenario and should be used in evaluating dermal exposure.

Also, footnote (b) on these spreadsheets suggests that the inhalation intake (CDI) is equal to the ingestion intake for VOCs. This is not consistent with EPA Region IV guidance that suggests that the inhalation of groundwater volatiles while showering/bathing is accounted for by doubling the ingestion volume as stated in footnote (f) on spreadsheets Appendix D-64a, D-137, and D-145. This discrepancy must be corrected.

Finally, an inhalation slope factor is provided for dieldrin on spreadsheet Appendix D-64b, but the ELCR was not calculated. The results of this calculation must be included.

Appendix D-102: The total presented for the total dermal hazard quotient (HQ) is incorrect. The value should be 0.0006.

Appendix D-151: Please clarify what footnote (a) is in reference to.

Appendix D-10 through D-186: The information provided in these spreadsheets is for AOC R which has not been selected as an no further action (NFA) site and therefore should not be included in this report.



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4.14 Appendix E

SWMU 5:

Page E-1-3 ¶ 1: The most recent Primary Drinking Water Standards (Spring 2002) should be used for screening Site groundwater data.

Page E-1-5 ¶ 7: This paragraph provides information pertaining to estimating volatile emissions from soil to ambient air. The risk spreadsheets provided in Appendix D indicate that none of the selected COPCs were evaluated for this pathway. Please clarify this discrepancy.

SWMU 10:

Page E-2-1 ¶ 5: This paragraph incorrectly identifies the evaluated potentially exposed populations as "under current conditions". The statement should state "under potential future conditions".

Table E-2-4: The number of samples "N" should read "4" and the Frequency of Detection should read "50%" as is shown on Table 2-1 on page 2-3 of the NFA report.

SWMU 14

Page E-4-3: ¶s 2 and 3: The HI values provided for the residential adult and residential child do not agree with the values provided in Table 4-8. This discrepancy must be corrected.

SWMU 15 ¶ 2: The laboratory data should be provided to confirm that detected VOCs are in fact due to laboratory contamination.

Table E5-7: BEQ and arsenic should be identified as risk drivers for the industrial worker, exposure to surface soil and iron should be identified as a risk driver to residential adult, exposure to groundwater.

AOC B:

Table 6-6: Iron should be identified as a risk driver for the residential child, exposure to surface soil.

AOC K:

Table 9-5: Thallium should be listed as the main risk driver for the industrial worker,



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exposure to groundwater.